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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLN. OF: Fotland et al

SERIAL NO: 09/299,388

FILED: April 27, 1999

FOR: Method and Apparatus for Producing Uniform Small Portions...

GROUP: 1734 DOCKET: MICRODOSE 99.01

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REQUEST FOR CORRECTION OF FILING RECEIPT

Dear Sir:

We enclose a copy of the filing receipt in which we have marked in red ink the correction for a clerical error contained therein, i.e., Total Claims "73" should be - -72- -. Also enclosed is a copy of the Claims as support of the correct information. Please note claim 24 was left out in the numbering process.

We respectfully request that you correct your records and send a corrected filing receipt. We believe there are no fees involved with the

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correction. However, in the event there are any fees payable, please charge them to our Deposit Account No. 08-1391.

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Respectfully submitted,

Norman P. Soloway
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Reg. No. 24,315

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on
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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/299,388	04/27/99	1734	$2,000.00	99.01	4	~~73~~ 72	5

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Applicant(s) RICHARD FOTLAND, HOLLISTON, MA; JOHN BOWERS, CLARKSBURG, NJ; WILLIAM JAMESON, WEST WINDSOR, NJ.

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 05/17/99

TITLE

METHOD AND APPARATUS FOR PRODUCING UNIFORM SMALL PORTIONS OF FINE POWDERS AND ARTICLES THEREOF

PRELIMINARY CLASS: 118

DATA ENTRY BY: SCOTT, JOSEPH TEAM: 03 DATE: 08/06/99

(See reverse for new important information)

CLAIMS

1. A method for depositing particles from an aerosol onto a dielectric substrate comprising the steps of charging said aerosol particles, positioning said charged aerosol particles in a deposition zone proximate to said dielectric substrate, and applying an alternating electric field in said deposition zone by which said charged particles are removed from the aerosol and deposited on said dielectric substrate thus forming a deposit.

2. The method according to claim 1, wherein said deposit has relatively more mass than a deposit that can be formed using a static electric field.

3. The method according to claim 1, wherein said aerosol particles are charged.

4. The method according to claim 1, wherein said aerosol particles comprise particles of dry powder.

5. The method according to claim 1, wherein said aerosol particles comprise liquid droplets.

6. The method according to claim 4, wherein said dry powder particles are triboelectrically charged.

7. The method according to claim 5 wherein said liquid droplets are charged by a charge injector during droplet formation.

8. The method according to claim 1, wherein said aerosol particles comprise a pharmaceutical.

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9. The method according to claim 4, wherein said dry powder particles comprise carrier particles coated with a bioactive agent.

10. The method according to claim 3, wherein said aerosol particles have a higher charge to mass ratio than is achievable using triboelectric charging.

11. The method according to claim 10, wherein said charged aerosol particles achieve a relatively higher velocity than that achievable with triboelectrically charged particles thereby forming said deposit more quickly.

12. The method according to claim 1, wherein said aerosol particles are charged within said deposition zone.

13. The method according to claim 1, wherein said aerosol particles are charged outside of said deposition zone.

14. The method according to claim 1, wherein said alternating electric field has a magnitude between 1KV/cm and 30KV/cm.

15. The method according to claim 1, wherein the frequency of said alternating electric field is between 1Hz and 100KHz.

16. The method according to claim 1, wherein the duty cycle of said alternating field is substantially different than 50%.

17. The method according to claim 16, wherein said duty cycle is 90%.

18. The method according to claim 1, wherein said alternating electric field is formed between a first electrode positioned at an end of said deposition zone opposite

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to and facing said dielectric substrate and a second electrode in contact with said dielectric substrate on the opposite side of where said deposit is formed.

19. The method according to claim 18, wherein said first electrode is an element of an ion emitter.

20. The method according to claim 19, wherein said aerosol particles are discharged after being deposited.

21. The method according to claim 18, wherein the contact area of said second electrode with said dielectric substrate determines the location of said deposition.

22. The method according to claim 1, wherein substantially all of said aerosol particles are removed from said aerosol to form said deposit.

23. The method according to claim 1, wherein the gas of said aerosol is predetermined.

25. The method according to claim 1, wherein said dielectric substrate comprises a packaging medium.

26. The method according to claim 25, wherein said packaging medium comprises a blister, tablet, capsule or tublet.

27. The method according to claim 26, wherein the blister comprises a plastic or metal foil blister package.

28. The method according to claim 1, wherein said dielectric substrate comprises a pharmaceutical carrier.

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29. The method according to claim 1, wherein said dielectric substrate comprises a carrier for carrying said deposit from said deposition zone to another location for further processing.

30. The method according to claim 1, wherein said dielectric substrate is edible.

31. The method according to claim 3, wherein said ion emitter comprises a corona wire or corona point.

32. The method according to claim 3, wherein said ion emitter comprises a silent electric discharge device.

33. The method according to claim 3, wherein said ion emitter comprises an ionizing radiation source.

34. The method according to claim 12, wherein said aerosol particles are charged by an ion emitter.

35. The method according to claim 22, wherein the mass of said deposit is controlled by integrating the mass of said aerosol particles over a period of time.

36. The method according to claim 35, wherein said period of time is determined by the measured mass of said aerosol particles.

37. The method according to claim 22, wherein multiple deposits may be made using multiple deposition zones supplied from a single aerosol source by multiplexing the application of the alternating deposition field between the deposition zones.

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38. A controlled quantity of powder carried on a substrate, comprising a plurality of layers of said powder in which adjacent layers carry opposite charges.

39. A controlled quantity according to claim 38, wherein said powder comprises a pharmaceutical.

40 . A controlled quantity according to claim 38, wherein said substrate comprises a packaging medium.

41. A controlled quantity according to claim 40, wherein said packaging medium comprises a blister, tablet, capsule or tublet.

42. A controlled quantity according to claim 41, wherein said blister comprises a plastic or metal foil blister package.

43. An apparatus for depositing onto a substrate controlled quantities of particulate material from a source of said material, said apparatus comprising a charge generator for applying a predetermined electrostatic charge to particles of said material upstream of a deposition zone in which said substrate is located, and a controller for repeatedly varying the polarity of charge being applied to said material and to said substrate.

44. The apparatus according to claim 43, wherein the controller comprises a switch oscillator.

45. The apparatus according to claim 43, wherein the controller includes a clock for varying the polarity of charge over time.

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46. The apparatus according to claim 43, wherein said controller is adapted to switch polarity applied to said powder and to said substrate in synchronization.

47. The apparatus according to claim 43, and including sensors for measuring the mass flow of aerosol particles that pass into and out of the deposition zone.

48. A method for depositing particles from an aerosol onto a substrate that comprises moving an aerosol through a deposition region, providing means for electrically charging said particles, and providing an alternating electric field between said substrate and said aerosol particles whereby said particles are deposited on the surface of said substrate.

49. The method according to claim 48, wherein said particles are solid.

50. The method according to claim 48, wherein said particles are liquid.

51. The method according to claim 48, wherein said particles comprise carrier particles coated with a bioactive agent.

52. The method according to claim 48, wherein said particles comprise a pharmaceutical.

53. The method according to claim 48, wherein said aerosol carrier is nitrogen gas.

54. The method according to claim 48, wherein said substrate comprises a blister pack.

55. The method according to claim 38, wherein said substrate is comprises of an electrically insulating material.

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52. The method according to claim 48, wherein said particles comprise a pharmaceutical.

53. The method according to claim 48, wherein said aerosol carrier is nitrogen gas.

54. The method according to claim 48, wherein said substrate comprises a blister pack.

55. The method according to claim 48, wherein said substrate is comprised of an electrically insulating material.

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56. The method according to claim 48, wherein said substrate is comprised of an electrically conducting material.

57. The method according to claim 48, wherein said electrically charging means employs a corona wire.

58. The method according to claim 48, wherein said electrically charging means employs corona emitting points.

59. The method according to claim 1, wherein said electrically charging means includes a charge source comprising a solid dielectric member, a first electrode substantially in contact with one side of said solid dielectric member, a second electrode substantially in contact with an opposite side of said solid dielectric member, with an edge surface of said second electrode disposed opposite said first electrode to define an air region at the junction of said edge surface and said solid dielectric member, and means for applying an alternating potential between said first and second electrodes of sufficient magnitude to induce ion producing electrical discharges in the air region between the dielectric member and the edge surface of said second electrode.

60. The method according to claim 48, wherein said electrically charging means includes triboelectric charging of said aerosol particles.

61. The method according to claim 48, wherein said electrically charging means includes induction charging of said aerosol particles.

62. The method according to claim 48, wherein said aerosol particles are charged outside of said deposition region.

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63. The method according to claim 48, wherein said aerosol particles are charged within said deposition region.

64. The method according to claim 48, wherein said electrically alternating field has a magnitude between about 1 kV/cm an about 30 kV/cm.

65. The method according to claim 48, wherein said electrically alternating field has a frequency of oscillation between about 1 Hz and 100 kHz.

66. The method according to claim 48, wherein the duty cycle of the alternating field is adjusted to provide maximum efficiency of said particle deposition.

67. The method according to claim 48, wherein said electrically alternating field is formed between a first electrode positioned at one side of said deposition region opposite and facing said substrate and a second electrode contiguous to said substrate.

68. The method according to claim 48, wherein the pattern of deposited material is defined by the geometry of said alternating electric field.

69. The method according to claim 48, wherein the pattern of deposited material is defined by an electrically conducting mask disposed adjacent said charging means.

70. The method according to claim 48, wherein the aerosol particle mass flow is monitored whereby the mass of deposited particles is controlled.

71. The method according to claim 48, wherein multiple deposits may be made using multiple deposition regions supplied from a single aerosol source by

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multiplexing the application of the alternating deposition field between the deposition regions.

72. A pharmaceutical unit dose medicament powder package wherein the powder is deposited using electrostatic means to form alternately charged layers of said powder.

73. The package of claim 72, wherein said electrostatic means includes moving an aerosol through a deposition region, providing means for electrically charging said medicament powder, and providing an alternating electric field between said powder package and said aerosol.

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